REMARKS

In the May 17, 2006 Office Action, claims 1-3, 5-12, 14-19, 22-24 and 26-28 stand rejected in view of prior art, while claim 21 was indicated as allowed. Claim 20 was also rejected for failing to comply with the enablement requirement.

Status of Claims and Amendments

In response to the May 17, 2006 Office Action, Applicants have cancelled claim 20 as indicated above. Applicants wish to thank the Examiner for the indication of allowable subject matter. Thus, claims 1-3, 5-12, 14-19, 21-24 and 26-28 are pending, with claims 1, 10, 21, 23 and 28 being the independent claims. Reconsideration of the pending claims is respectfully requested in view of the following comments.

Claim Rejections - 35 U.S.C. §112

In paragraph 1 of the Office Action, claim 20 was rejected under 35 U.S.C. §112, first paragraph. In response, Applicants have cancelled claim 20 without prejudice. Withdrawal of the rejection is respectfully requested.

Rejections - 35 U.S.C. § 102

In paragraphs 4 and 5 of the Office Action, claims 1, 3, 5, 7-12, 14, 17, 22-24 and 28 stand rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,653,045 (Ferrell) or U.S. Patent No. 5,772,784 (Mohindra et al).

It is well established in U.S. patent law that two separate elements in the claims ***cannot*** be designated as the same element in the references.

In paragraph 4 of the Office Action, the valves 612, 614, the drain 620 and the level 622 of Ferrell are designated as making up two separate claimed elements. The valves 612, 614 are designated as constituting the means for supplying inert gas ***and*** then designated again as constituting a means for maintaining a predetermined thickness of the drying fluid.

In the same fashion, the drain 620 is designated as constituting a means for maintaining a predetermined thickness of the drying fluid ***and*** designated as a means for continuously lowering a fluid face. Moreover, the level 622 is designated as a fluid face ***and*** designated as a means for maintaining a predetermined thickness of the drying fluid.

Accordingly, Applicants respectfully assert that the rejection of the claims using Ferrell is improper since individual elements of Ferrell are used to designate more than one claimed element.

Likewise, in paragraph 5 of the Office Action, the drain region 231, the drain valve 236 and the substrate carrier support 248 of Mohindra et al are designated as making up two separate claimed elements. The drain region 231 and the drain valve 236 are designated as constituting the step of lowering a fluid face (claim 1), means for lowering a fluid face (claim 10) and an exhausting section (claims 23 and 28) ***and*** then designated as constituting a step, means or device for maintaining a predetermined thickness of the drying fluid. In the same fashion, the substrate carrier support 248 is designated as constituting a supporting means ***and*** then designated as constituting a means for maintaining a predetermined thickness of the drying fluid.

Accordingly, Applicants respectfully assert that the rejection of the claims using Mohindra et al is improper since individual elements of Mohindra et al are used to designate more than one claimed element.

Throughout the Office Action, the claimed predetermined thickness is considered as zero. The Office Action has applied an ***arbitrary*** definition to the word "thickness" such that the thickness of the drying fluid is zero and as such does not exist.

Applicants respectfully submit that the term "thickness" should be given its meaning within the scope of the specification. The Federal Circuit in *Phillips v. AWH Corp.*, 415 F.3d

1303 (Fed. Cir. 2005) stated that a definition cannot be arbitrarily chosen in interpreting the claims. The Federal Circuit found that arbitrarily chosen definitions focus on the abstract meaning of words rather than on the meaning of the claim term to the artisan within the context of the specification. Thus, according to *Phillips*, the meaning of "thickness" should be determined from the context of the specification and the claims.

The thickness of the drying fluid is discussed at, for example, paragraph [0039] on page 5 of the substitute specification:

> Consequently, a liquid layer of the drying fluid having a sufficient thickness is generated on the cleaning fluid so that drying of the substrates with greatly little drying mark is rapidly realized using MARANGONI effect. Further, the thickness of the fluid layer of the drying fluid can be determined to be sufficiently great so that securely drying is performed up to the inner section (concave section) of a pattern even when the substrate has the pattern.

The thickness of the drying fluid is also discussed at, for example, paragraph [0046] on page 7 of the substitute specification:

> Therefore, the liquid drops of the drying fluid are securely supplied to the liquid face of the cleaning fluid by increasing the supplying quantity during exhausting of the cleaning fluid so that the thickness of the liquid layer of the drying fluid on the cleaning fluid is continuously maintained to be equal to or greater than a predetermined thickness.

As can be seen from the above excerpts, Applicants' specification does not give an alternative meaning to "thickness" that implies a thickness of zero such that the drying fluid does not exist. For example, in the above excerpt, a thickness of the drying fluid is used in order to achieve few drying marks using the Marangoni effect. Thus, Applicants use the term "thickness" in the specification and claims in relation to a drying fluid that is actually in three dimensional existence. In view of *Phillips* and Applicants' specification, the drying fluid should be considered as actually having a thickness and existing rather than arbitrarily

assigning a thickness of zero and regarding the drying fluid as not in three dimensional existence.

The claims themselves also define a liquid layer of a drying fluid with a thickness greater than zero, i.e., a drying fluid that exists. For example, in independent claims 1, 10, 21, 23 and 28, "the drying fluid" is repeatedly recited within the claims. Furthermore, "a liquid layer of a drying fluid" is not stated in the alternative. Thus, the claims require a drying fluid to exist within the claimed method or device. In order for the drying fluid to exist, there must be a thickness greater than zero.

Not only do the claims repeatedly call for a drying fluid, but the claims further state a ***thickness*** of a liquid layer of the drying fluid. By specifically requiring a drying fluid ***and*** a thickness of a liquid layer of the drying fluid, the claims require a three dimensional existence. The claims twice require a drying fluid to exist with a thickness, the thickness being greater than zero.

Accordingly, since the claims require that a liquid layer of the drying fluid actually exist, the prior art of record does not disclose a method step of supplying liquid drops onto a fluid face of a cleaning fluid such that a thickness of a liquid layer of the drying fluid on the cleaning fluid is continuously maintained to be equal to or greater than a predetermined thickness. In addition, the prior art of record does not disclose a means for controlling or a control device configured for controlling the supply of the inert gas and for maintaining a predetermined thickness of the drying fluid on the cleaning fluid.

Applicants respectfully request withdrawal of the rejections.

Rejections - 35 U.S.C. § 103

In paragraphs 7-11 of the Office Action, claims 1-3, 5-9, 15, 16, 18, 19, 26 and 27 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Ferrell in view of

Mohindra et al or U.S. Patent No. 4,816,081 (Mehta et al), U.S. Patent No. 6,216,709 (Fung et al), U.S. Patent No. 6,152,153, U.S (Takase et al) and Patent No. 6,247,479 (Taniyama et al).

As stated above, Ferrell or Mohindra et al does not disclose the claimed limitations of independent claims 1, 10 and 23. Fung et al, Takase et al and Taniyama et al do not remedy the deficiencies of Ferrell and Mohindra et al. Fung et al, Takase et al and Taniyama et al do not disclose a method step of supplying liquid drops onto a fluid face of a cleaning fluid such that a thickness of a liquid layer of the drying fluid on the cleaning fluid is continuously maintained to be equal to or greater than a predetermined thickness. Furthermore, Fung et al, Takase et al and Taniyama et al do not disclose a means for controlling or a control device configured for controlling the supply of the inert gas and for maintaining a predetermined thickness of the drying fluid on the cleaning fluid.

Discussion of Dependent Claims

Applicants believe that dependent claims 2, 3, 5-9, 11, 12, 14-19, 22, 24, 26 and 27 are allowable over the prior art of record in that they depend from independent claims 1, 10 and 23, and therefore are allowable for the reasons stated above. Also, the dependent claims are further allowable because they include additional limitations.

The further allowability of a selection of the dependent claims is discussed below.

Dependent Claim 2

Ferrell discloses a fixed nozzle assembly 606 and fixed valves 612 and 614 that are not inclined at an inclination angle. Ferrell does not disclose housing the substrates 601 within the housing 602 at an inclined position. Mohindra et al does disclose inclining a substrate carrier 242. However, Mohindra et al discloses fixed gas inlets 302, 304 and 306 that are not at an inclination angle. Therefore, the combination of Ferrell and Mohindra et al

does not show substrates in an inclined condition ***and*** supplying liquid drops of the drying fluid with the nozzle inclined at an inclination angle.

In Figure 1, Mehta et al illustrates wafers 20 at an inclined condition and discloses an outlet from valves 60, 82 at an inclined condition.

However, dependent claim 2 states:

> the method houses the substrates within the processing vessel in an inclined condition at a predetermined angle with respect to a vertical plane, ***and supplies the liquid drops of the drying fluid*** using the nozzle with the nozzle inclined at an inclination angle substantially similar to the predetermined angle of the inclined substrates.

Mehta et al does not supply ***liquid drops of a drying fluid***. As stated on page 5 of the Office Action, Mehta et al teach supplying inert ***gas*** into the processing vessel during exhausting of the cleaning liquid. See column 6, lines 24-30. Accordingly, it is unclear why one of ordinary skill in the art would be motivated to combine Ferrell, which does not disclose supplying liquid drops of the drying fluid with a nozzle inclined at an inclination angle, with Mehta et al, which does not disclose supplying ***liquid*** drops of a drying fluid. Applicants respectfully submit that there is no suggestion in Mehta et al or Ferrell to ***supply the liquid drops of the drying fluid*** using the nozzle with the nozzle inclined at an inclination angle.

Applicants respectfully request allowance of claim 2 in view of the above comments.

Dependent Claims 3 and 12

Claim 3 recites:

> the method determines an introduction direction of the drying fluid into the processing vessel and determines an introduction initial speed of the drying fluid so as to expand the drying fluid up to an entire width of the substrates on the fluid face of the cleaning fluid.

It appears that neither Ferrell, Mohindra et al or Mehta et al determine an introduction direction of the drying fluid and an introduction initial speed of the drying fluid. The Office Action is silent as to how Ferrell, Mohindra et al or Mehta et al disclose a method that ***determines*** an introduction direction of the drying fluid into the processing vessel and ***determines*** an introduction initial speed of the drying fluid so as to expand the drying fluid up to an entire width of the substrates on the fluid face of the cleaning fluid. Furthermore, Ferrell, Mohindra et al and Mehta et al do not teach expanding the drying fluid up to an entire width of the substrates on the fluid face of the cleaning fluid.

Claim 12 recites:

> ***the means for introducing the drying fluid determines*** an introduction direction of the drying fluid into the processing vessel and ***determines*** an introduction initial speed of the drying fluid so as to expand the drying fluid up to an entire width of the substrates on the fluid face of the cleaning fluid.

The nozzle assembly 606 of Ferrell and the carrier gas inlet 306 of Mohindra et al were designated as the means for introducing a drying fluid in the Office Action. The Office Action is silent as to how the nozzle assembly 606 or the carrier gas inlet 306 ***determines an introduction direction*** and ***determines an introduction initial speed*** of the drying fluid so as to expand the drying fluid up to an entire width of the substrates on the fluid face of the cleaning fluid.

The nozzle assembly 606 of Ferrell produces ultrafine droplets having a low velocity. However, Ferrell and Mohindra et al do not teach expanding the drying fluid up to an entire width of the substrates on the fluid face of the cleaning fluid. Furthermore, the nozzle assembly 606 and the carrier gas inlet 306 are incapable of ***determining the introduction direction*** and ***determining the initial speed*** of the drying fluid in order to expand the drying fluid up to an entire width of the substrates on the fluid face of the cleaning fluid.

Applicants respectfully request allowance of claims 3 and 12 in view of the above comments.

Dependent claim 5

Claim 5 recites:

> the method ***increases a supplying quantity*** of the drying fluid and/or the inert gas into the processing vessel ***during*** exhausting of the cleaning fluid from the processing vessel.

Mohindra et al and Mehta et al disclose introducing an inert gas during exhausting of the cleaning fluid. However, Ferrell, Mohindra et al and Mehta et al ***do not*** teach a method that ***increases a supplying quantity*** of the drying fluid and/or the inert gas into the processing vessel ***during*** exhausting of the cleaning fluid from the processing vessel.

Applicants respectfully request allowance of claim 5 in view of the above comments.

Dependent Claims 11 and 24

Claims 11 and 24 require that support be provided for the substrates within the processing vessel in an ***inclined condition*** and with the nozzle ***inclined***.

Ferrell discloses a fixed nozzle assembly 606 and fixed valves 612 and 614 that are ***not inclined*** at an inclination angle. Furthermore, Ferrell ***does not*** disclose housing the substrates 601 within the housing 602 at an inclined position.

Applicants respectfully request allowance of claims 11 and 24 in view of the above comments.

Dependent Claim 18

Claim 18 requires a means for moving the nozzle ***towards*** the substrates ***during*** exhausting of the cleaning fluid from the processing vessel.

Column 10, lines 47-63 of Takase et al describes moving the substrates 1 under the nozzles 43, 45, 47. Once the substrates 1 are in position under the nozzles 43, 45, 47, the

nozzles 43, 45, 47 are moved reciprocally relative to the substrates 1. Applicants respectfully submit that Takase et al does not disclose means for moving the nozzles ***towards*** the substrates because the substrates 1 of Takase et al are moved into position before movement of the nozzles 43, 45, 47. Only after the substrates 1 are in position do the nozzles 43, 45, 47 begin to move. However, the movement of the nozzles 43, 45, 47 ***is not towards*** the substrates 1 but reciprocally relative to the substrates as shown in Figures 9 and 10. Figures 9 and 10 show the nozzles 43, 45, 47 moving in the same longitudinal plane as the substrates 1 once the substrates 1 are in position. In addition, nozzle 47 is described as treating a preselected area extending from one end to another end of the substrate 1. See column 10, lines 28-32. Thus, the nozzles 43, 45, 47 cannot be considered as moving ***towards*** the substrates 1.

Moreover, Takase et al makes no mention of moving the nozzle towards the substrates ***during exhausting of the cleaning fluid from the processing vessel.*** Ferrell also ***does not*** disclose supplying a liquid or a gas ***during*** exhausting of the cleaning fluid from the processing vessel. Therefore, the combination of Ferrell and Takase et al ***does not*** disclose: 1) movement of a nozzle ***towards*** the substrates; and 2) movement of the nozzle ***during*** exhausting of the cleaning fluid from the processing vessel.

Applicants respectfully request allowance of claim 18 in view of the above comments.

Dependent Claim 19

Claim 19 requires a means for circulating the ***drying fluid*** when the means for introducing the drying fluid is not introducing the drying fluid under a liquid condition within the processing vessel.

Taniyama et al discloses a circulation circuit 80 for conditioning the chemical solution stored in the tank 71. However, column 9, lines 18-22 of Taniyama et al disclose that the

chemical solution in the tank 71 is a mixture solution of ammonia solution and hydrogen peroxide solution used for a washing process. This is not a ***drying fluid***. The drying fluid of Taniyama et al is stored in a tank 68a as illustrated in Figure 5. Taniyama et al ***does not*** disclose a means for circulating the ***drying fluid***.

Applicants respectfully request allowance of claim 19 in view of the above comments.

Entry of Amendment

Applicants have cancelled claim 20 without prejudice. For this reason, entry of this amendment is respectfully requested.

Allowable Subject Matter

In paragraph 12 of the Office Action, claim 21 was indicated as allowed. Applicants wish to thank the Examiner for this indication of allowable subject matter. Thus, independent claim 21 is believed to be allowed.

Conclusion

In view of the foregoing comments, Applicants respectfully assert that claims 1-3, 5-12, 14-19, 21-24 and 26-28 are now in condition for allowance. Reexamination and reconsideration of the pending claims are respectfully requested.

Respectfully submitted,

David J. McCrosky
Reg. No. 56,232

SHINJYU GLOBAL IP COUNSELORS, LLP
1233 Twentieth Street, NW, Suite 700
Washington, DC 20036
(202)-293-0444
Dated: October 31, 2006
G:\10-OCT06-YTY\DK-US035114 AMDT.doc